The former are represented by interesting *fishes* and *Reptilia* which show various ranges, when compared with European relations.

The marine animals are on the whole jurassic, representing various groups, up to uppermost Jurassic.

With these few remarks I conclude my sketch of the Gondwána fossils ; my object will have been gained if I succeed in drawing general attention to these interesting remains but more especially that of those who are in charge of collieries or quarries and so induce them to be careful in looking out for specimens. I also desire to show to the scientific world, particularly of Europe, how much has already been accomplished, by the small body of officers employed in these areas, who have many a time to carry on their work under most unfavourable circumstances.

XIII.—*Additional note on the identification of the ancient diamond mines visited by Tavernier.*—*By* V. Ball, M. A., F. G. S.

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I return to this subject as since my last paper was published I have obtained some additional information on the subject, part of which is the direct result of the publication of that paper, and the remainder is in further illustration of the views put forward in it.

Raolconda.—By applying what seemed to be a legitimate arithmetical test to the figures given by Tavernier as indices of the position of this place, the conclusion was arrived at that it was to be identified with Rawduconda on the Tungabhadra river. The chief objection to this view was that we had no independent knowledge whatever of there ever having been diamond mines there, but since, as a matter of fact, nothing was known of the Geology, it seemed possible that diamond bearing rocks might occur there. As an alternative the only other place I could suggest was Ramulkota, to which indeed some of Tavernier's stages pointed, but, on the system of calculation adopted, this locality did not seem to fit so well. I did not venture to write on this subject without doing my best to obtain local information, but as it did not come, or rather as that which was received was more of the nature of speculation than actual fact, my paper was printed, and it has had the advantage of leading to the final settlement of the one doubtful point, namely, the position of Raolconda. As will presently be shown by a quotation from Rennell, which was not included in my last paper, this question was discussed and, as we now know, wrongly decided about 100 years ago.

I must here first record my thanks to Mr. Maurice, H. Wilkinson, Secretary to the Nizam in the Public Works Department, for having done

all he could to obtain local information for me in Hyderabad. Mr. King on reading my paper has seen his way to identifying the stages between Golconda and Raolconda, some of which, as being common to the routes to either Rawduconda or Ramulkota I have already noted. Mr. King's local knowledge is of course invaluable in an enquiry of this kind, and I may say that I agree with his conclusion and adopt the necessary consequence from it that the league of Tavernier was not the equivalent of the modern French league, as it was taken to be in my calculation, but was only about two miles, and therefore the Gos which contained 4 leagues was equal to 8 miles and was of the same value as the *Gow* of Heyne.*

The stages on Tavernier's route and Mr. King's identification of them are as follow:

Golconda = Golconda.
to Canapour = Ghunpoora Lat. 16°·34′ N. Long. 78°·6′·30″.
to Parquel = Boorgul, Lat. 16°·59′ N. Long. 78°·17 ·30″ E.
to Cakenol = Kakanoor, Lat. 16°·55′ N. Long. 78°·23′ E.
to Canal-Candanor = Kundanool, Lat. 16° 29′ N. Long. 78° 22′·30″ E.
to Setapour = Satapoor, Lat. 16°·14′·15″ N. Long. 78°·24′30″ E.
to The river = Kistna.
to Alpour = Alumpoor, Lat. 15°·53′ N. Long. 78° 11′·30″ E.
to Canol = Karnul.
to Raolconda = Ramulkota, Lat. 15° 34′ Long. 78° 3′·15″.

The total distance is given by Tavernier as 17 goss which, if the gos equalled 11·12 miles would be 189 miles, but by taking the gos at 8 miles, would be only 136 miles and as Mr. King shows that Tavernier's route was not absolutely direct, the 16 miles, *i. e.*, the excess over the direct distance between Golconda and Ramulkota, namely 120 miles, is at once accounted for. Tavernier gives the distance from his Canol to Raolconda as being $2\frac{1}{2}$ gos this at eight miles to the gos = 20 miles or about the distance from Karnul to Ramulkota. There are the remains of extensive mines at Ramulkota and there is now no room for doubt that it was at this spot that Tavernier saw the diamond bearing stratum, which was very thin, being hooked out by means of iron rods.

Col. Rennells'† remarks on the subject above alluded to were as follow: "Raolconda, a famous diamond mine, is placed in Mr. Montresor's map, about 15 G. miles to the west of Ralicotte, and 12 from the north bank of the Kistnah; but I know not on what authority. Tavernier, who visited Raolconda, gives its distance from Golconda at 17

* It has been already stated in the previous paper, p. 32, that Heyne spoke of a unit of measure called the *Gow* as being equal to 8 miles.

† Memoir on a Map of Hindustan, p. 353.

gos, of four French leagues each. He crossed a river, that formed the common boundary of Golconda and Visiapour, about 4 gos, or more, before he came to Raolconda: and this river can be no other than the Beemah; which, to this day, forms the eastern boundary of Visiapour; and passes 80 or 82 G. miles to the west of Golconda, crossing the road from it to Ralicotte. If we reckon the 82 miles, 13 gos: that is, forming a scale from the distance between Golconda and the river Beemah, each gos will be 6·3 G. miles in horizontal distance (or nearer three than four French leagues); and Raolconda will be placed about 25 G. miles on the west of the Beemah; or 11, east of Ralicotte*.

"If we take the gos at four French leagues, without regarding the proportion arising from the above calculation, it will bring Raolconda very near the situation assigned it by Montresor. But I have nevertheless adopted the former, thinking it, on the whole, the most consistent. Cæsar Frederick says, that the mines (Raolconda) are six days' journey from Bisnagur: but this will apply equally to either of the above positions."

To which may be added that it will also suit the position of Ramulkota which is under 110 miles, but in a different direction altogether, namely, slightly north of east instead of nearly due north. Cæsar Frederick's original statement as translated by Thomas Hickocke† is as follows: "Five days' journey (not six) from Bezeneger (*i. e.* Bijayanagar) is the place where they get diamants. I was not there but it was told me that it was a great place, compassed with a wall, and that they sell the earth within the wall for so much a squadron, and the limits are set how deepe or how low they shall digge. Those diamants that are of a certain size and bigger than that size are all for the king, it is many years agone since they got any there."

Elsewhere he says that the diamonds from this region were called *chiappe* to distinguish them from those from Delly and Iaua (= Java?).

Gani Coulour of Tavernier. With reference to this mine, which is famous for having produced the great Mogul Diamond, Mr. King thinks that I have fully established its identity with the modern Kollur on the Kistna. Indeed had a doubt remained it would have been fully dispelled by a further route to Masulipatam from Golconda given separately by Tavernier, and which passes through Kollur or the so-called Gani.

So far as he has been able, Mr. King has offered the following identifications of the localities mentioned in Tavernier's previously quoted itinerary.

Montecour = ? Moonoogodoo, Lat. 17° 6″ N. Long. 79° 7′ 25″.

Nagelpar = Nagoolpad, Lat. 17° N. Long. 79° 42′.

Savaron = Surrawaram, Lat. 16° 52′ 30″ Long. 79°·51′ 30″.

Mellaserou = Mailacheroo.

* ? = Telicotte in the Kaladgi district.

† Hakluyt's Voyages, p. 221.

I would direct the attention of any one knowing the neighbourhood to the identification of Almaspinde, Kaper and Eligada though indeed it is now of no very great importance to fix them.

Tavernier's route to Masulipatam above alluded to is as follows,* the distances in this case being given in *costes* not in *gos*.

Golconda to Tenara,	4	Costes	
Tenara to Jatenagar,	12	„	
Jatenagar to Patengi,	12	„	
Patengi to Penguel,	14	„	
Penguel to Nagelpar (Nagoolpad),	12	„	17 miles.
Nagelpar, to Lakabaron (Lukkarum),	11	„	15 „
Lakabaron to Coulour (Kollur),	11	„	15½ „
There runs a great river by the town of Coulour, which falls into the gulf of Bengala near Masulipatam.			
Coulour to Kah Kaly,	12		
Kah Kaly to Beyouar (Bezwada),	6		
Near Beyouar you must repass the river of Coulour (*i. e.*, Kistna) Beyouar to Vouchir,	4	„	
Vouchir to Nilimor,	4	„	
Half way between Vouchir and Nilimor you cross a great river on a timber floating bridge.			
Nilimor to Milmol,	6	„	
Milmol to Masulipatam,	4	„	

It would be useless to attempt to fit Tavernier's distances too closely with modern measurements, but it would seem from the equivalent measurements in miles, taken from the map, that the *coste* here was under 1½ miles. Tavernier speaks of the badness of the roads which no doubt necessitated many turnings. He praises the palkis, wherein "you are carried with more speed than in any part of India."

The value of the *rati* in Tavernier's time is a sore puzzle. He gives it as equal to 3½ grains; these in my calculation of the weight of the great Mogul diamond, as it was when he saw it, I treated of as French grains the equivalent of which would be 2·7 English grains, and I stated that if instead of this we could put into the equation 1·84 or more properly 1·848 we should get out the exact weight of the Koh-i-Nur. Now according to Mr. E. Thomas, F. R. S.† the old *rati* in the normal Hindu system

* Travels, Part II, Book I. Chapter XI, p. 69.

† Percy's metallurgy, silver and gold, p. 375.

= 1·75 grains and in Akbar's time = 1·935 grains, the mean of these or 1·8137 was so near the required figure that the matter appeared settled; but in Capt. Hamilton's 'East Indies' dated 1727 there is a very full table of weights in which the *rati* is stated to be equal to 3½ grains English, so that one may fairly despair of solving this question.

In reference to the myth regarding the method of obtaining diamonds described by Marco Polo, Nicolo Conti and many others, not omitting Sindbad the Sailor, I have, since my paper was printed, met with numerous accounts of sacrificial rights connected with the opening of mines. The late Mr. M. Fryar when visiting a tin-washing at Maleewoon in Tenasserim was requested to take off his boots as he was told that on a former occasion a European visitor having walked up to the stream without having done so, the guardian spirit took offence, and the supply of tin ceased till the washers had gone to the expense of sacrificing two buffaloes.

Of especial interest as accounting for the wooden structure which Nicolo Conti supposed was for the purpose of flinging the pieces of meat from one mountain to another is a description by Dr. John Anderson of a sacrifice witnessed by himself during his expedition to Yunan. Two buffaloes were offered up by the Khakyens to the Nâts or evil spirits. The animals having been slaughtered over two bamboo altars were cut up and the meat distributed, certain portions with cooked rice being placed on a lofty bamboo scaffolding for the use of the Nâts. The Nâts under such circumstances would infallibly be represented by birds, and among the birds, in most of the hilly regions of India there would probably be included some of the common white scavenger vultures *(Neophron)*. Curiously enough one of the early accounts mentions white eagles, among the birds which carried away the meat with diamonds sticking to it. A naturalist, however, would object to the idea of this bird carrying anything in talons or bill, it would devour the offering on the spot. The rest of the story is doubtless due to the fertile imagination of a traveller who supposed the preliminary sacrifice to be part of the actual process of finding diamonds.

In conclusion it may be stated that the forthcoming volume on the Economic Geology of India contains a full *résumé* of information on these subjects and that there is also one though less complete in a small volume recently published on the Diamonds, Gold and Coal of India.